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MAYER, FORTKORT & WILLIAMS, PC  
251 NORTH AVENUE WEST  
2ND FLOOR  
WESTFIELD, NJ 07090

EXAMINER

ROY, SIKHA

ART UNIT PAPER NUMBER

2879

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/933,987

Applicant(s)

SILVERNAIL ET AL.

Examiner

Sikha Roy

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9-11 and 29-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 9 and 29, referring to the limitation comprising the patterned getter layer being 'sufficiently' narrow, there is no explanation ascertaining the degree of narrowness and thus renders the claims indefinite.

Claims 10 and 11 are rejected being dependent on the base claim 9.

Claims 30 and 31 are rejected being dependent on the base claim 29.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or  
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1,3 -5,7, 8, 16 -18, 21 - 24 are rejected under 35 U.S.C. 102(e) as being anticipated by U. S. Patent 6,383,664 to Bernius et al.

Regarding claim 1 Bernius et al. disclose (column 3 lines 35-45, column 5 lines 64-67 Figs 2,3) organic light emitting device comprising a substrate 10, an OLED display area comprising four pixels disposed over the substrate each one comprising anode regions 20,21, cathode regions 41,42 and light emitting region 30, a cover 50 over the display area and a patterned getter layer disposed between the substrate and the cover.

Referring to claim 3 the getter layer is provided on the inner surface of the cover.

Regarding claims 4 and 5 Bernius et al. disclose (column 6 lines 34-36) the patterned getter layer was formed onto the inside cavity formed by the raised rim so that the getter layer is laterally beyond the OLED display and surrounds the display area in the form of ring.

Regarding claims 7 and 8 Bernius et al. disclose (column 6 lines 1-3) the getter layer comprises preferably of Group II A metals such as calcium, barium, magnesium.

Referring to claim 16 Bernius et al. disclose a sealing region (adhesive) provided between the cover and the substrate.

Claim 17 recites the method of making the OLED device with the same limitations as of the device structure claimed in claim 1 and is rejected for the same reason (see rejection of claim 1).

Regarding claim 18 Bernius et al. disclose (column 6 lines 34,35) the getter layer comprising barium is provided by vacuum deposition.

Referring to claim 21 Bernius et al. disclose (column 3 lines 27- 67, column 4 lines 28,29) organic optoelectronic device structure comprising a substrate, an organic

optoelectronic device such as organic photodetector disposed over the substrate, a cover over the optoelectronic device and a patterned getter layer disposed between the substrate and the cover.

Referring to claim 22 phototransistors are optoelectronic devices as evidenced by U. S. Patent 6,420,031 to Parthasarathy et al.

Regarding claims 23 and 24 Bernius et al. disclose the optoelectronic devices such as photo cells for example photodetectors, photovoltaics formed by sandwiching films comprising organic optoelectronic materials between electrodes.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2,12-15,19,20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 6,383,664 to Bernius et al. in view of U. S. Patent 6,465,953 to Duggal.

Claim 2 differs from Bernius et al. in that Bernius et al. do not exemplify the patterned getter layer provided on the substrate.

Duggal in analogous art of electroluminescent devices disclose the getter material provided on the substrate. It is further noted that this getter material protects

the organic light emitting layer from being damaged by oxygen during a desired period of operation and does not obstruct the display area.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to provide the patterned getter layer of OLED device of Bernius et al. on the substrate as taught by Duggal for protecting the organic light emitting layer from being damaged by oxygen during a desired period of operation.

Referring to claim 12 Bernius et al. do not the sublayers comprising hole transporting and electron transporting layers with the light emission layer.

Duggal discloses (column 4 lines 57-63) light emitting layer comprising hole transporting and electron transporting layers. Duggal further discloses these additional sublayers generally increase the efficiency with which the holes and electrons recombine to produce light.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the hole transporting and electron transporting layers with the light emitting layer of the OLED device of Bernius et al. as taught by Duggal to increase the efficiency of the device for producing light.

Regarding claim 13, Duggal discloses (column 1 lines 41-43) anode region, cathode region and the substrate can be transparent when it is desirable to allow light to be emitted from both sides of the device.

Regarding claims 14 and 15 Duggal discloses (column 1 lines 39-41) the electrode positioned on the surface of the light-emitting region is formed transparent and cause to transmit light outside. It is well known in the art that the position of the

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cathode and anode can be interchanged and hence with an opaque substrate when the cathode disposed over the light-emitting region is transmitting light it is transparent and when the anode disposed over the light-emitting region is transmitting light it is transparent.

Regarding claim 19 Bernius et al. do not disclose getter layer comprising metal oxides provided in the form of a paste.

Duggal discloses (column 8 lines 19-25) materials for use as the 'getters' for water and/or oxygen can be alkaline earth metal oxides such as BaO, SrO, CaO and MgO. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include metal oxides such as BaO, CaO as suggested by Duggal inside the OLED device of Bernius et al. as getters for absorbing water and/or oxygen and increasing the long-term stability of the device. Referring to the limitation comprising applying the getter in the form of a paste it is a well known method of producing layers on a substrate.

Regarding claim 20 the technique of applying the paste by screen printing and extrusion is commonly used in electronics industry to form a patterned layer as evidenced by U. S. Patent 5,849,442 to Liu et al.

Claims 6 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 6,383,664 to Bernius et al. in view of U. S. Patent 5,931,713 to Watkins et al.

Regarding claim 6 Bernius et al. do not disclose the patterned getter layer provided over the non-emitted regions between some of the pixels.

Watkins et al. in relevant art of display device disclose (claim 1 Fig.2) getter material 20 provided on the anode substrate forming a grille defining plurality of pixel regions 22. It is noted (column 1 lines 65-68, column 2 lines 1-8) this way gettering can be done efficiently and does not require additional space or additional component for housing.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to apply the gettering material in the space between the pixels as suggested by Watkins et al. in the OLED device of Bernius et al. for more efficient gettering action and no additional space for housing the getter material.

Claim 25 essentially recites the same limitation as of claim 6 and hence is rejected for the same reason.

Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 6,383,664 to Bernius et al.

Regarding claim 9 Bernius et al. disclose (column 5 lines 37- 40) the thickness of the lid should be such to provide resistance to flexing. As the getter, a 100nm film of barium is deposited onto the inside cavity of the rim of the lid, the getter layer should not provide resistance to flexing while handling and hence should be narrow.

Regarding claims 10 and 11 Bernius et al. disclose the claimed invention except for getter layers comprising plurality of narrow bands and small dots respectively. It would have been obvious matter of design choice to make the getter layer narrow by comprising plurality of narrow bands and small dots since applicant has not disclosed this getter layer solves any stated problem or for any particular purpose and it appears



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that the invention would perform equally well with the getter layer as disclosed by Bernius et al.

Claims 26,28,29,30,31 is rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 6,383,664 to Bernius et al. in view of U. S. Patent 6,465,953 to Duggal.

Regarding claim 26 Bernius et al. disclose all the limitations except that the OLED device being flexible and comprising flexible substrate, flexible OLED display area and flexible cover over the display.

Duggal discloses (column 7 lines 53-65) plastic substrates which are flexible and can be placed on one or both sides (top side acting as cover) of OLED device. It is noted that flexible substrates and cover forming flexible OLED device exhibits desired flexibility at the same time retaining physical properties and strength. These flexible OLED devices can find multitude of applications in electronic devices.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the rigid (glass or quartz) substrate of Bernius et al. by the flexible substrate (plastic) in OLED device as taught by Duggal for flexibility and strength of the device which can find multitude of applications in electronic devices.

Claims 28,29,30 and 31 essentially recite the same limitations as of claims 7,9,10 and 11 respectively and hence are rejected for the same reason (see rejections of claims 7,9-11).

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 6,383,664 to Bernius et al. and U. S. Patent 6,465,953 to Duggal. in view of U. S. Patent 6,146,225 to Sheats et al.

Regarding claim 27 Bernius et al. and Duggal do not disclose a composite barrier region comprising two or more planarizing layers and two or more high density layers.

Sheats et al. disclose (column 2 lines 17-26, column 3 lines 15-28, Fig 1) the barrier region preventing oxygen and moisture from penetrating inside includes two planarizing (polymer) layers 191,193 and high-density layers 192. It is noted that the planarizing layer provides exceptionally smooth low-defect surface for the application of the oxide (high density) layer and the high-density layer provides good barrier for water and oxygen.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the flexible substrate or cover of the OLED device of Bernius and Duggal with a composite barrier region comprising planarizing and high-density layers as taught by Sheats et al. for preventing water or oxygen from reaching the active layers of OLED device.

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 6,383,664 to Bernius et al. and U. S. Patent 6,465,953 to Duggal. in view of U. S. Patent 5,931,713 to Watkins et al.

Claim 32 recites the same limitation as of claim 6 and hence is rejected for the same reason.

**Conclusion**

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following prior art references are cited to further show the state of the art with respect to encapsulation of electronic devices.

U. S. Patent 5,591,379 to Shores

U. S. Patent 6,226,890 to Boroson et al.

U. S. Patent 6,284,342 to Ebisawa et al.

WO 00/16938 to Ghosh et al.

**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikha Roy whose telephone number is (703) 308-2826. The examiner can normally be reached on Monday-Friday 8:00 a.m. – 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (703) 305-4794. The fax phone number for the organization is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

*S.R.*

Sikha Roy  
Patent Examiner  
Art Unit 2879

*N.D. Patel*  
NIMESHKUMAR D. PATEL  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800